Common Seaweeds and Seagrasses of India

HERBARIUM

Vol.2

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Foreword

The Central Marine Fisheries Research Institute, under the ICAR has been undertaking basic, strategic and applied research in marine fisheries for the past six decades. Being a signatory to the Convention on Biological Diversity (CBD) and realising the need to establish national referral centres for marine organisms, the Institute mordernised the Marine Biodiversity Museum at its headquarters at Cochin. Padma Vibhushan Prof. M.S. Swaminathan inaugurated this Museum on 4th February, 2006. Subsequently, as per section 39 of the Biological Diversity Act, 2002, the Institute was recognized as a 'Designated National Repository' by the Government of India, with authorisation to keep specimens of different categories of biological material in safe custody.

The Museum displays organisms including fishes, echinoderms, molluscs, crustaceans, corals, seaweeds etc. collected from a wide spectrum of niches ranging from estuaries to coastal and deeper waters of the Indian seas. Forming a major component of the collections in the Museum, the seaweeds and seagrasses evince a lot of interest among visitors due to their importance as a source of food, fodder, industrial products and bioactive compounds. My colleagues in the Marine Biodiversity Division have processed and laminated samples of these plant materials without much change in colour and texture.

It is with great satisfaction that I introduce a unique collection of seaweeds and seagrasses as herbaria in the Biodiversity Museum of CMFRI. The new technique of laminating the herbaria after processing and preserving has yielded excellent results. I congratulate and compliment the team led by Dr. Mary K. Manisseri, Head, Marine Biodiversity Division for the efforts put in for bringing out this unique herbaria. I hope this novel attempt would instil enthusiasm among students and researchers and this would be of immense use in both education and research.

Dr. G. Syda Rao
Director
Central Marine Fisheries Research Institute

Preface

The Marine Biodiversity Division of the Central Marine Fisheries Research Institute, Cochin, established in the year 2004 with the prime mandate of developing biodiversity knowledge-base is bestowed with the task of maintaining and updating the collections in the Designated National Repository Museum of the Institute.The splendid display of around 1600 specimens in the Museum offers a glimpse of the bioresources of the Indian seas. The collections attract students, teachers, scientists and the general public with students forming more than 85% of the total visitors.

Marine plants are one among the prime exhibits in the Museum. An attempt has now been made to display seaweeds and seagrasses as herbaria along with the wet preserved samples. The plants were collected from the southeast and southwest coasts of India during 2009-2010. Of the Herbaria prepared, 72 species of seaweeds and 7 species of seagrasses have been displayed in the Marine Biodiversity Museum at Cochin with duplicates of 46 species of seaweeds and 5 species of seagrasses in the Museum of the Regional Centre of CMFRI at Mandapam. Herbaria have also been bound with 18 species of green algae, 12 species of brown algae and 6 species of seagrasses as Vol. I and 34 species of red algae as Vol. II. This procedure of processing and laminating plant materials, if adopted, would go a long way in serving as an effective tool both in education and research. I hope this would be of immense use to those engaged in plant taxonomy and biodiversity studies.

The encouragement and guidance given by Dr. G. Syda Rao, Director, CMFRI is gratefully acknowledged. We are greatly indebted to Dr. M. Umamaheswara Rao, Retd. Professor, Andhra University, for his expert advice without which this work would not have been completed. The help rendered by Dr.V.S.K. Chennubhotla, Shri J.R. Ramalingam and Ms.E.G.Reshmi in the collection, identification and preparation of herbaria is gratefully acknowledged. Sincere thanks are due to all staff members of the Marine Biodiversity Division for their co-operation which facilitated smooth execution of the work.

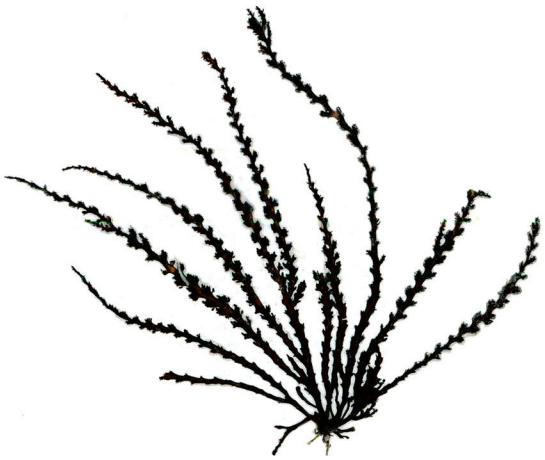
Dr. Mary K. Manisseri
Head, Marine Biodiversity Division
Central Marine Fisheries Research Institute

Contents

RED ALGAE

CLASS RHODOPHYCEAE

- Red algae are mostly marine, found in intertidal and subtidal regions, frequently found attached to coral reefs.
- In India, 431 species of red algae have been reported under 135 genera (Kaliaperumal and Kalimuthu, 2004).
- Range from small unicellular forms to one metre long multicellular forms. Outer layer of the cell wall is composed of pectic substances which yield agar. The pigment phycoerythrin gives the characteristic red colour.
- Red algae are the only source of the hydrocolloids - agar and carrageenan. *Gelidiella acerosa*, *Gracilaria corticata* var. *corticata*, *G. crassa*, *G. foliifera* and *G. verrucosa* are the agar yielding red algae available in exploitable quantities in India. Agar is used in the preparation of culture medium and laxatives.
- Important carrageenan yielding genera of red algae in the Indian waters are *Hypnea* and *Kappaphycus*. Carrageenan is employed as thickening agent in food, textile and cosmetic industries.
- Floridean starch is the main food reserve. 'Nori' from *Porphyra* is widely used in Japan as a complement to rice, and 'dulse' from *Palmaria* is a popular snack in Britain. Many red algae like *Rhodymenia* are used as animal feed.



Acanthophora muscoides (Linn.) Bory., 1828

AC.8.2.1.1 Date: 27-5-2009 Locality: Gulf of Mannar

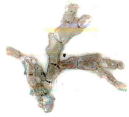
Acanthophora spicifera (Vahl.) Borgesen, 1910

AC.8.2.1.2 Date: 25-5-2009 Locality: Gulf of Mannar

Amphiroa anceps (Lam.) Decaisne, 1842

AC.5.1.1.1 Date: 27-5-2009 Locality: Gulf of Mannar




Amphiroa foliacea Lamouroux, 1824

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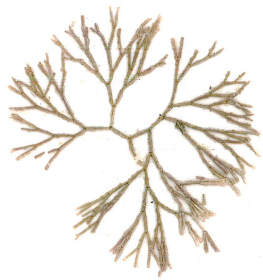
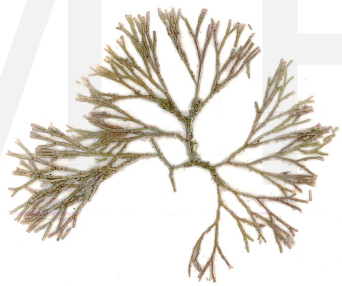
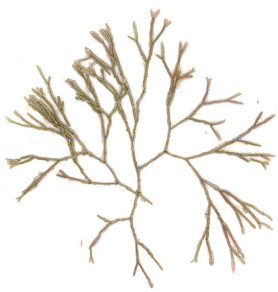
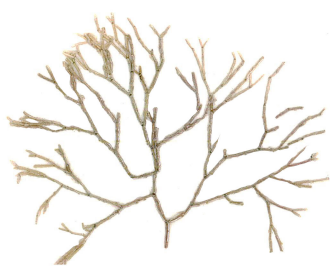






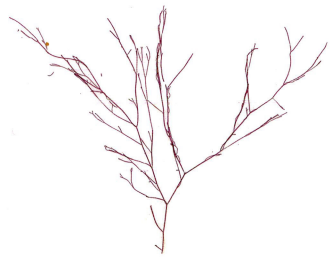


Amphiroa fragilissima (Linn.) Lamouroux, 1816

AC. 5.1.1.2 Date: 26-5-2009 Locality: Palk Bay

Botryocladia leptopoda (J.Ag.) Kylin, 1931

AC.7.2.1.1 Date: 3-2-2010 Locality: Palk Bay



Centroceras clavulatum (C.Ag.) Montagne,1846

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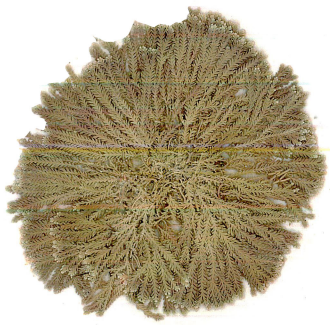
Champia globulifera Borgesen, 1937

AC.7.1.1.1 Date: 27-5-2009 Locality: Gulf of Mannar



Cheilosporum spectabile Harv., 1874

AC.5.1.2.1 Date: 27-5-2009 Locality: Gulf of Mannar

Gelidiella acerosa (Forssk.) Field. & Hamel, 1934

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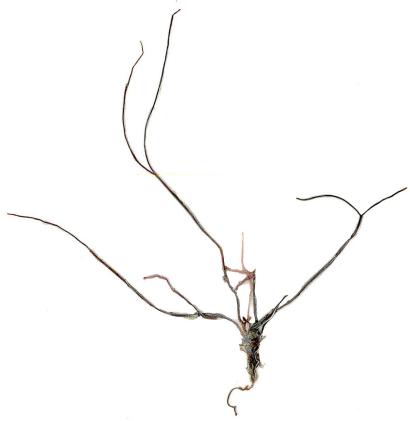

Gelidiopsis variabilis (Greville) Schmitz, 1851

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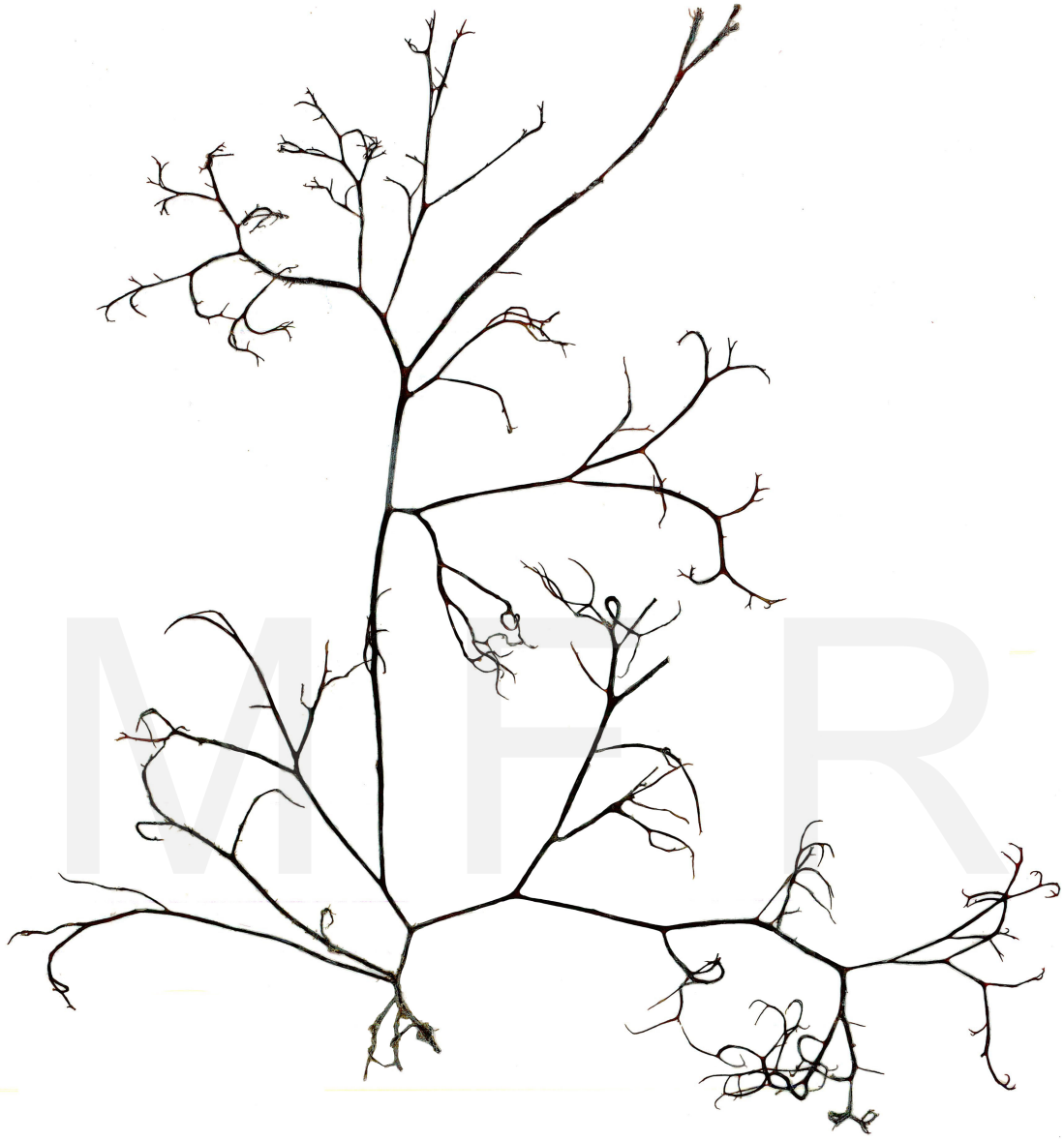

Gracilaria arcuata Zanardini, 1858

AC.3.1.1.1 Date: 26-5-2009 Locality: Palk Bay

Gracilaria corticata var. *corticata* J.Agardh, 1852

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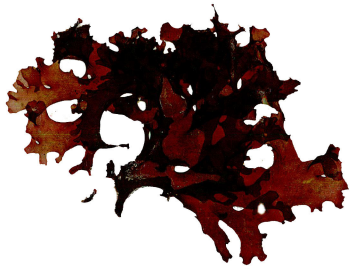
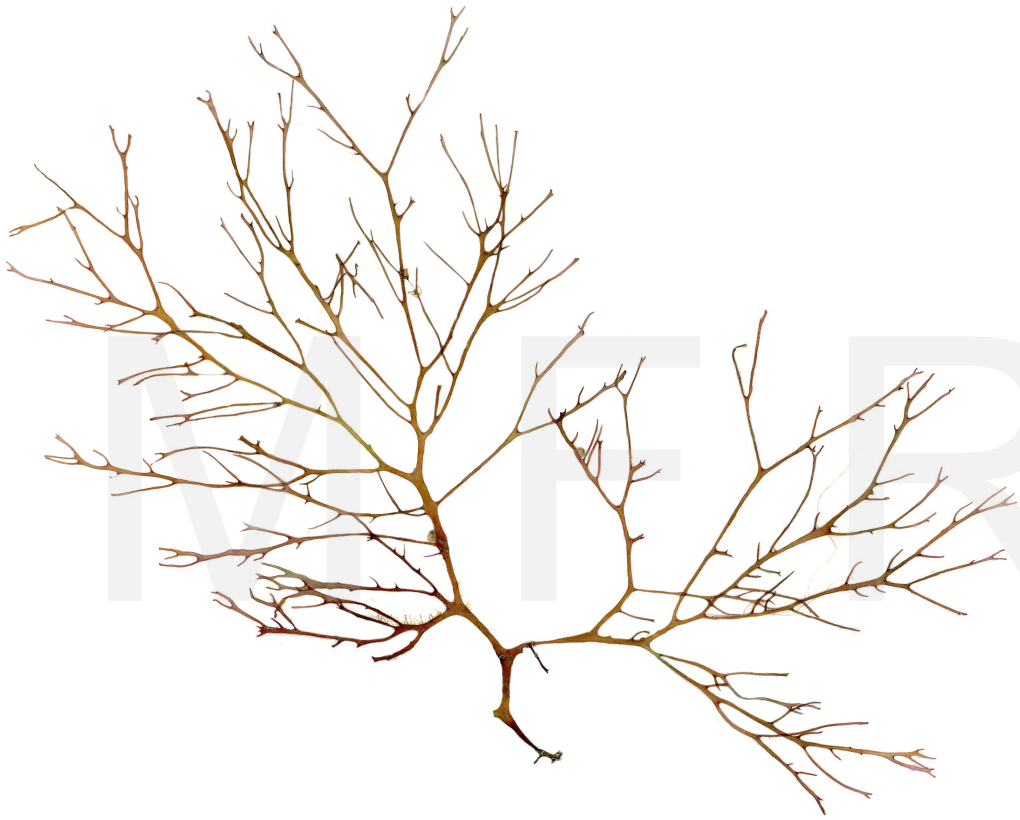


Gracilaria corticata var. *Pudumadamensis*
Krishnamurthy & Rajendran, 1987

AC.3.1.1.3 Date: 26-5-2009 Locality: Palk Bay

Gracilaria edulis P. Silva, 1952

AC.3.1.1.5 Date: 26-5-2009 Locality: Palk Bay



Gracilaria foliifera (Forssk.) Borges., 1932

AC.3.1.1.6 Date: 25-5-2009 Locality: Gulf of Mannar

Gracilaria salicornia (C.Ag.) Dawson, 1954

AC.3.1.1.4 Date: 26-5-2009 Locality: Palk Bay

Gracilariopsis lemaneiformis (Bory) Dawson, Alecto & Foldvik, 1823

AC.3.1.2.1 Date: 26-5-2009 Locality: Palk Bay

Grateloupia filicina (Lam.) C.Agardh, 1822

AC.4.1.1.1 Date: 27-5-2009 Locality: Gulf of Mannar

Grateloupia lithophila Borgesen,1938

AC.4.1.1.2 Date: 27-5-2009 Locality: Gulf of Mannar

Halymenia dilatata Zanardini, 1851

AC.4.1.2.1 Date: 28-5-2009 Locality: Gulf of Mannar

Halymenia floresia (Clem.) C.Agardh,1817

AC.4.1.2.2 Date: 29-5-2009 Locality: Palk Bay

Hypnea pannosa J.Agardh, 1847

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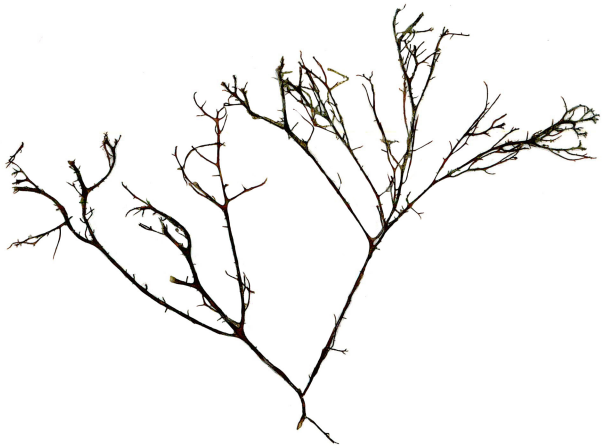

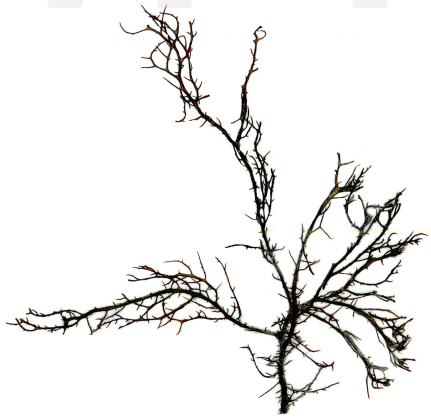

Hypnea valentiae (Turn.) Montagne, 1841

AC.6.1.1.2 Date: 26-5-2009 Locality: Palk Bay

Jania rubens (Linn.) Lamouroux, 1758

AC.5.1.3.1 Date: 2-2-2010 Locality: Palk Bay

Kappaphycus alvarezii (Doty) Doty ex P.Silva, 1996

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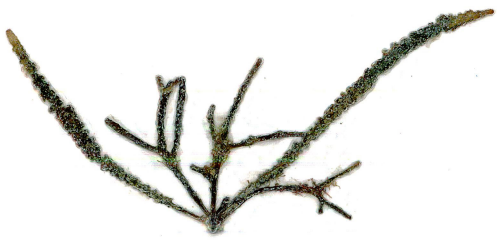

Laurencia papillosa (C. Ag.) Greville, 1830

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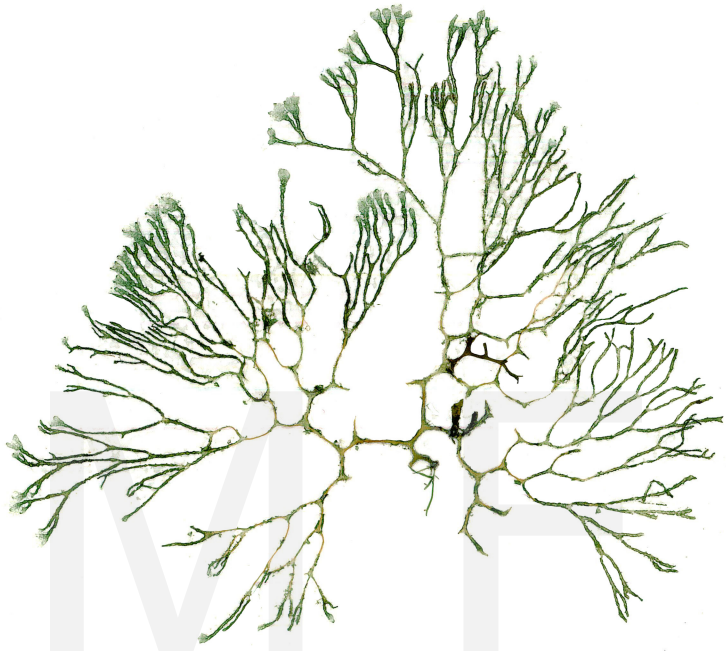

Liagora doridis Zeh, 1912

AC.1.2.1.1 Date: 2-2-2010 Locality: Palk Bay

Liagora orientalis J.Agardh, 1896

AC.1.2.1.2 Date: 2-2-2010 Locality: Palk Bay

Portieria hornemannii (Lyng.) P.C. Silva, 1987

AC.4.2.1.1 Date: 28-5-2009 Locality: Gulf of Mannar

Sarconema filiforme (Sonder) Kylin, 1932

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Scinaia bengalica Borgesen, 1938

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Solieria robusta (Grev.) Kylin, 1934

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Spyridia fusiformis Borgesen, 1937

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